

U.S. Department of Energy
Washington, D.C.

ORDER

DRAFT
DOE O 225.1X

Approved: XX-XX-04

SUBJECT: ACCIDENT INVESTIGATIONS

1. OBJECTIVES. To prescribe requirements for conducting investigations of certain accidents occurring at Department of Energy (DOE) or National Nuclear Security Administration (NNSA) operations and sites and to prevent the recurrence of such accidents.
2. CANCELLATION. DOE O 225.1A, *Accident Investigations*, dated 11-26-97. Cancellation of an Order does not by itself modify or otherwise affect any contractual obligation to comply with requirements of the Order. Cancelled Orders that are incorporated by reference in a contract remain in effect until the contract is modified to delete reference to the requirements in the cancelled Orders.
3. APPLICABILITY.
 - a. Primary DOE Organizations, Including NNSA Organizations. Except for the exclusions in paragraph 3c, this Order applies to all Primary DOE Organizations (see Attachment 1 for a complete list of Primary DOE Organizations). This Order automatically applies to Primary DOE Organizations created after it is issued.
 - b. Site/Facility Management Contractors.
 - (1) Except for the exclusions in paragraph 3c, the Contractor Requirements Document (CRD), Attachment 1, sets forth requirements of this Order that will apply to contracts for the operation, management, maintenance, construction, demolition, or remediation of a DOE-owned or -leased facility.
 - (2) At their discretion or as may be directed by DOE or NNSA line management, contractors may utilize the accident investigation techniques, processes, and analytical tools established by this Order to investigate incidents, accidents, or occurrences that would not otherwise require appointment of a Type A or Type B accident investigation board.
 - (3) The CRD does not automatically apply to other than site/facility management contractors. Application of requirements of the CRD to other than site/facility management contracts will be communicated in the Department of Energy Acquisition Regulation or through the regulatory process.
 - (4) Heads of field organizations are responsible for notifying contracting officers when site/facility management contracts are affected by requirements of this Order.

- (5) Once notified, the contracting officer is responsible for incorporating the CRD into the laws, regulations, and DOE directives clause of each affected site/facility management contract.
- (6) As the laws, regulations, and DOE directives clause of a site/facility management contract states, regardless of the performer of the work, the site/facility management contractor with the CRD incorporated into its contract is responsible for compliance with the requirements of the CRD.
- (7) An affected site/facility management contractor is responsible for flowing down requirements of the CRD to subcontractors at any tier as necessary to ensure the contractor's compliance with its requirements
 - (a) In doing so, the contractor must not flow down requirements to subcontractors unnecessarily or imprudently.
 - (b) That is, the contractor will—
 - 1 ensure that it and its subcontractors comply with CRD requirements and
 - 2 only incur costs that would be incurred by a prudent person in the conduct of competitive business.

c. Exclusions.

- (1) This Order does not apply to activities conducted under the authority of the Director, Naval Nuclear Propulsion Program (Deputy Administrator for Naval Reactors) as assigned by Executive Order 12344 [statutorily prescribed by Title 42 United States Code (U.S.C.) 7158 note].
- (2) Consistent with Secretarial Delegation Order Number 00-033.00A to the Administrator and Chief Executive Officer, Bonneville Power Administration, this Order does not apply to oversight of environmental programs or occupational safety and health programs at Bonneville Power Administration.

4. REQUIREMENTS.

a. Overview.

- (1) Type A accident investigations are conducted for the more serious accidents at DOE/NNSA facilities.
- (2) For Type A accident investigation boards, appointing officials are the Assistant Secretary for Environment, Safety and Health (for DOE boards)

or the NNSA Deputy Administrator for Defense Programs (for NNSA boards).

- (3) Type B accident investigation boards are appointed by heads of responsible DOE or NNSA field organizations.
- (4) Both types of investigations use the same fundamental approach and report format.
- (5) Board members are Federal DOE or NNSA employees unless specific waivers (paragraph 5) allow Federal employees of other Agencies to serve on DOE boards.
- (6) Each accident investigation report is reviewed by a separate quality review panel (QRP) appointed for that purpose.
- (7) Based on accident investigation board judgments of need, line management develops corrective action plans to prevent recurrences.

b. Categorization.

- (1) Heads of field organizations will categorize accidents, incidents, and occurrences in accordance with the algorithm in Attachment 3 to determine whether a Type A or Type B investigation is required.
- (2) Categorization of accident investigations as Type A and Type B will be reported in a timely manner to—
 - (a) the DOE Office of the Deputy Assistant Secretary for Facility Safety or
 - (b) the NNSA Deputy Administrator for Defense Programs who will notify the Deputy Assistant Secretary for Facility Safety.
- (3) Categorization will be determined expeditiously, taking into account that timeliness is crucial to conducting an accurate investigation, preserving the accident scene and evidence, and identifying causal factors.
- (4) Uncertainty about proper categorization should be mutually resolved by the head of the field organization and the Deputy Assistant Secretary for Facility Safety (acting on behalf of the Assistant Secretary for Environment, Safety and Health) or between the head of the field organization and the NNSA Deputy Administrator for Defense Programs.

- (5) Heads of field organizations may also determine that accident, incident, or occurrence circumstances warrant submitting a timely request for an accident investigation waiver (paragraph 5).

c. Notification of Other Agencies.

- (1) Public law and regulations assign other Agencies responsibility for investigating certain types of accidents that could occur at DOE or NNSA facilities. In some cases, DOE or NNSA may have a memorandum of understanding with another Agency to that effect.
- (2) The appointing official will—
 - (a) determine whether applicable memoranda of understanding have been executed through Headquarters or field organizations,
 - (b) notify Agencies with which the Department has memoranda of understanding or which have responsibilities or interests related to the accident under investigation, and
 - (c) notify the Deputy Assistant Secretary for Facility Safety when other Agencies are informed of accidents under investigation.

d. Appointing the Accident Investigation Board and Quality Review Panel.

- (1) Appointing officials (paragraph 6h) will formally designate DOE or NNSA employees to serve on an accident investigation board within 3 calendar days after accident categorization.
- (2) If board appointments are delayed beyond the required 3 calendar days, the rationale for the delay must be documented in the accident investigation report.
- (3) An accident investigation board consists of a chairperson and three to six members, all of whom must be qualified as accident investigators by the Deputy Assistant Secretary for Facility Safety (See DOE G 225.1A-1, *Implementation Guide for Use with DOE O 225.1, Accident Investigations*, dated 11-26-97).
- (4) The appointing official or his/her representative will brief board members on roles, responsibilities, and other pertinent information within 3 calendar days of their appointment.
- (5) Board appointment must be documented in writing and must include—
 - (a) the scope of the investigation,

- (b) individuals appointed to the board,
 - (c) special provisions of the investigation, and
 - (d) a specified completion date for the final report (usually 30 calendar days from date on which the board was appointed).
- (6) The scope of the investigation, which includes all levels of the organization up to and beyond the level of the appointing official, will consist of—
 - (a) gathering facts,
 - (b) analyzing causes,
 - (c) developing conclusions, and
 - (d) developing judgments of need pertaining to DOE, NNSA, and contractor organizations and management systems that could have or should have prevented the accident.
- (7) Board chairpersons must be—
 - (a) DOE or NNSA senior managers with demonstrated managerial competence, preferably members of the Senior Executive Service or employees at a general service senior grade level and
 - (b) personnel deemed qualified to serve as board chairperson by the Deputy Assistant Secretary for Facility Safety (See DOE G 225.1A-1).
- (8) Unless a waiver (paragraph 5) is requested and approved, board members must—
 - (a) be DOE or NNSA Federal employees who have subject matter expertise in areas of relevance to the accident and who have knowledge of the Department's Safety Management System Policy and Integrated Safety Management System,
 - (b) be qualified as accident investigators by the Deputy Assistant Secretary for Facility Safety, and
 - (c) not include a supervisor and subordinate on the same board.
- (9) As determined by the chairperson, the board may be supported by advisors and consultants and may include investigative and technical expertise support from the Deputy Assistant Secretary for Facility Safety.

- (10) The board will—
 - (a) report only to the appointing official or his/her representative (identified in the letter/memorandum of appointment) and
 - (b) act independent of the direct line management chain responsible for day-to-day operation or oversight of the facility, area, or activity involved in the accident.
 - (11) The Deputy Assistant Secretary for Facility Safety will coordinate establishment of an independent QRP for each accident investigation board.
 - (12) The QRP will be appointed as soon as practicable after the investigation board has been formed.
 - (13) Members will be appointed by the Assistant Secretary for Environment, Safety and Health, the NNSA Deputy Administrator for Defense Programs, and for some investigations, by other program Secretarial Officers.
 - (14) The QRP will work directly with the accident investigation board chairperson to ensure that a comprehensive report is issued. Toward that end, the QRP will review the draft investigation report to ensure that it conveys the results of the investigation clearly and concisely. Report content for review includes—
 - (a) the accident description (what happened),
 - (b) causal factors (why it happened), and
 - (c) judgments of need (what can be done to prevent a recurrence).
 - (15) QRP comments will be documented and submitted to the board chairperson for resolution.
- e. Investigate the Accident.
- (1) The board will conduct a thorough investigation of all individuals, organizations, management systems, and facilities having a stake in or potential impact on the accident or the operation or oversight of the facility, area, or activity involved in the accident and will include all levels of the organization up to and beyond the level of the appointing official.
 - (2) To determine the facts, the board will—

- (a) examine the accident scene and DOE or NNSA and contractor documentation,
 - (b) interview witnesses and other personnel directly associated with the accident,
 - (c) perform engineering tests and analyses,
 - (d) examine policies, standards, and requirements applicable to the accident,
 - (e) examine Headquarters and field management safety systems that could have contributed to or prevented the accident.
- (3) Following analysis of the facts, the board will identify causal factors and judgments of need and verify that—
 - (a) all causal factors and root causes have been identified,
 - (b) conclusions are supported by facts and analysis, and
 - (c) judgments of need are consistent with facts and conclusions.
- (4) The board will evaluate the—
 - (a) effectiveness of safety management systems (as defined by DOE P 450.4, *Safety Management System Policy*, dated 10-15-96),
 - (b) adequacy of policy and implementation, and
 - (c) effectiveness of line management oversight.
- (5) Before the investigation is completed, the board will conduct an internal review of the investigation process to ensure that—
 - (a) all pertinent facts, standards, and requirements have been identified;
 - (b) a thorough analysis has been conducted;
 - (c) causal factors have been determined; and
 - (d) judgments of need have been stated and can be supported by facts and causal factors.

f. Report Investigation Results.

- (1) The board's investigation report—

- (a) will not determine individual fault or propose punitive measures; and
 - (b) will identify judgments of need based on objective analysis of the facts; root and contributing causes; and DOE, NNSA, or contractor management systems that could have prevented the accident.
- (2) The board will offer the facts section of the draft investigation report to affected DOE, NNSA, and contractor line organizations for factual accuracy review before the report is completed.
- (3) Before the investigation is completed, the board will review the report to ensure—
 - (a) that it is technically accurate, complete, and internally consistent;
 - (b) that the report includes findings from analysis of management control and safety systems that may have contributed to the accident;
 - (c) that qualified, authorized personnel have reviewed the report for classified or unclassified controlled nuclear information or information protected by the Privacy Act.
- (4) Reviews will be documented and retained as part of the investigation file.
- (5) The investigation report will be submitted to the QRP for review and comments will be resolved.
- (6) The report will include a minority report section should board members wish to offer opinions different from findings of the board
- (7) Board members will sign and date the report and submit it to the appointing official within the time frame established when the board was appointed.
- (8) When the appointing official has accepted the report, the board is released from investigative responsibilities. The board chairperson will present briefings on investigation findings as follows.
 - (a) For Type A investigations, the chairperson and the head of the field organization will formally brief Headquarters, field line management, and the Assistant Secretary for Environment, Safety and Health and/or the NNSA Deputy Administrator for Defense Programs.

- (b) For Type B investigations, the chairperson formally briefs field and Headquarters line managers.
 - (9) The investigation report will include the appointing official's signed, dated statement accepting the report, the board's conclusions, and the judgments of need.
 - (10) Publication and distributed will be completed within 14 calendar days after the appointing official formally accepts the report.
 - (11) Distribution will be one copy each to—
 - (a) affected Secretarial Officers;
 - (b) the operations and/or field office;
 - (c) affected Headquarters program offices;
 - (d) the Assistant Secretary for Environment, Safety and Health; and
 - (e) the Office of the Deputy Assistant Secretary for Facility Safety, who also receives an electronic version.
 - (12) Senior managers of organizations identified in the judgments of need also will receive copies and requests from the appointing official for their organizations to submit corrective action plans [see paragraphs 6f(6) and 6g(16)].
- g. Investigation Follow-up. The appointing official will ensure that—
- (1) lessons learned from the accident investigation are developed in consultation with the board chairperson [paragraphs 6e(3) and 6h(7)] and
 - (2) corrective action plans addressing the judgments of need have been approved and issued by line management.
5. WAIVER REQUIREMENTS. The Deputy Assistant Secretary for Facility Safety reviews waiver requests and recommends approval or disapproval to the Assistant Secretary for Environment, Safety and Health or the NNSA Deputy Administrator for Defense Programs, who make final decisions, which must be documented. The Offices of the Deputy Assistant Secretary for Facility Safety and the head of the field organization will maintain copies of waiver requests and related documents. The Accident Investigation Program evaluates requests for the following waivers.
- a. Type A or Type B Accident Investigation. A request is submitted by the head of a field organization to the Assistant Secretary for Environment, Safety and Health

or the NNSA Deputy Administrator for Defense Programs when it has been determined that there would be no substantial lessons learned or Departmental benefit from the investigation. The request must document rationale for the request.

b. Accident Investigation Board Membership.

- (1) A request for waiver from the requirement to appoint only DOE or NNSA Federal employees to accident investigation boards may be submitted to the Assistant Secretary for Environment, Safety and Health or the NNSA Deputy Administrator for Defense Programs by an appointing official when accident circumstances or unavailability of subject matter experts justifies appointing Federal employees from other Agencies.
- (2) The request must document rationale for the waiver.
- (3) The Assistant Secretary for Environment, Safety and Health or NNSA Deputy Administrator for Defense Programs when acting as an appointing official, will document the need for outside Federal personnel in the appointing letter or memo.
- (4) Personnel from other Agencies must possess qualifications equivalent to those of DOE and NNSA accident investigators and board chairpersons.

6. RESPONSIBILITIES.

- a. Secretary of Energy establishes Departmental policy for conducting accident investigations for all DOE and NNSA Primary Organizations (Attachment 1).
- b. NNSA Deputy Administrator for Defense Programs.
 - (1) Serves as appointing official for Type A accident investigation boards for occurrences within NNSA or delegates the responsibility to a head of the field organization as specified in a memorandum of delegation (paragraph 5h).
 - (2) For judgments of need, ensures that the requirements of DOE O 414.1B, *Quality Assurance*, dated 4-29-04, are implemented.
 - (3) Dispositions requests for waivers from requirement to conduct Type A or Type B accident investigations or from the requirement to staff accident investigation boards using only NNSA or DOE Federal employees (paragraph 5).
 - (4) Considers recommendations from the Deputy Assistant Secretary for Facility Safety for limited scope investigations of occurrences, incidents, and accidents.

- (5) Appoints NNSA representatives to participate on QRPs [paragraph 4c(6)].
 - (6) Notifies the Deputy Assistant Secretary for Facility Safety when accident investigations have been categorized as Type A or Type B.
- c. Assistant Secretary for Environment, Safety and Health.
 - (1) Establishes the Accident Investigation Program.
 - (2) Serves as the appointing official for DOE Type A accident investigation boards or delegates the responsibility to the head of a field organization as specified in a memorandum of delegation (paragraph 6h).
 - (3) Dispositions requests for waivers from the requirement to conduct Type A or Type B investigations or from the requirement to staff accident investigation boards using only NNSA or DOE Federal employees (paragraph 5).
 - (4) Charters limited scope investigations for occurrences, incidents, or accidents based on recommendations from the Deputy Assistant Secretary for Facility Safety.
 - (5) Appoints Environment, Safety and Health representatives to participate on QRPs [paragraph 4c(6)].
- d. Deputy Assistant Secretary for Facility Safety.
 - (1) Develops, implements, and maintains the Department's accident investigation program, policy, and process development.
 - (2) Implements the Accident Investigation Program on behalf of the Assistant Secretary for Environment, Safety and Health.
 - (3) Evaluates and recommends to the Assistant Secretary for Environment, Safety and Health and the NNSA Deputy Administrator for Defense Programs whether an incident, accident, or occurrence may warrant appointment of a limited scope Type B or Type A accident investigation.
 - (4) Based on an assessment of the significance of an occurrence, incident, or accident, recommends to the Assistant Secretary for Environment, Safety and Health and the NNSA Deputy Administrator for Defense Programs the accident investigation board composition and members for Type A accident investigations.
 - (5) Submits to the Assistant Secretary for Environment, Safety and Health and the NNSA Deputy Administrator for Defense Programs recommendations for approval or disapproval of requests for waivers from the requirement to

conduct Type A or Type B accident investigations or appointment of non-DOE or -NNSA Federal employees to accident investigation boards.

- (6) Develops and disseminates information on uniform investigation techniques learned from accident investigations.
- (7) Establishes, implements, and maintains training and qualification programs for accident investigation board chairpersons and board members.
- (8) Establishes and maintains a Department-wide list of qualified accident investigators, board chairpersons, and subject matter experts identified by Secretarial Officers.
- (9) Provides investigative and technical subject matter expertise to appointing officials, accident investigation board chairpersons, and points of contact as requested.
- (10) Coordinates establishment of QRPs to review draft accident investigation reports and provides comments to the board chairperson before the appointing official accepts the report.
- (11) Reviews and comments on draft corrective action plans as requested.

e. Deputy Assistant Secretary for Performance Assessment and Analysis.

- (1) Analyzes occurrence data to assist in identifying trends and conditions surrounding accidents.
- (2) Performs complex-wide analyses of accidents and provides integrated safety management feedback to line management.
- (3) Disseminates throughout the Department lessons learned from accident investigations.

f. Secretarial Officers.

- (1) Ensure that Headquarters and field organizations maintain sufficient numbers of personnel qualified to serve as accident investigation board chairpersons and members.
- (2) Ensure that listings of qualified board chairpersons, members, and subject matter experts are maintained and current.
- (3) Provide updates of qualified personnel information at least annually to the Deputy Assistant Secretary for Facility Safety.
- (4) Cooperate with and support the boards during investigations.

- (5) As requested by the accident investigation board chairperson, review and validate for accuracy the facts in draft investigation reports within the allotted time frame.
- (6) For judgments of need, ensure that corrective action plans are developed and implemented per the requirements of DOE O 414.1B.
- (7) Nominate representatives to participate on QRPs.

g. Heads of Field Organizations.

- (1) Determine whether adequate accident investigation program implementation can be achieved by permitting the contractor to continue to operate under the terms of existing contracts requiring compliance with superseded accident investigation Orders or whether contracts should be modified to incorporate the requirements of revised accident investigation Orders.
- (2) Ensure that requirements of this Order are fully implemented.
- (3) Assign single points of contact to serve as Accident Investigation Program liaisons with the Office of the Deputy Assistant Secretary for Facility Safety.
- (4) Categorize accident investigations in accordance with the Accident Investigation Categorization Algorithm (Attachment 3).
- (5) Notify the Office of the Deputy Assistant Secretary for Facility Safety in timely manner when DOE accident investigations are categorized as Type A or Type B or the NNSA Deputy Administrator for Defense Programs when NNSA accident investigations are categorized as Type A or Type B.
- (6) Submit of accident investigation wavier requests when circumstances warrant (paragraph 5).
- (7) Serve as appointing officials for Type B investigation boards, and as delegated, for Type A investigation boards.
- (8) Ensure that qualified contractor personnel are available to support or provide training required for readiness to assist in accident investigations (per requirements of the CRD, Attachment 2 of this Order).
- (9) Ensure that readiness teams and emergency management personnel coordinate or integrate their activities to facilitate orderly transition of responsibilities for and preservation of an accident scene.

- (10) Cooperate with and assist in accident investigation board endeavors.
- (11) Ensure that a sufficient number of personnel qualified as accident investigation board chairpersons and members are available to implement this Order for both Type A and Type B investigations.
- (12) Provide qualified personnel as requested to serve on accident investigation boards for sites outside their purview.
- (13) Review draft Type A and Type B investigation reports for factual accuracy within the time allotted.
- (14) Initiate actions to address lessons learned from accident investigations at other sites.
- (15) For judgments of need resulting from Type A or Type B investigations, ensure that corrective action plans are developed and implement per the requirements of DOE O 414.1B.
- (16) Notify contracting officers when site/facility management contracts are affected by this Order.

h. Appointing Officials.

- (1) Formally appoint (in writing) DOE or NNSA employees to Type A or Type B accident investigation boards within 3 calendar days of accident categorization.
- (2) Ensure that the board's authority is clearly established to investigate accident causes, individuals, organizations, and management systems.
- (3) Ensure that the board is briefed on roles, responsibilities, authorities [paragraph 4d(4)], and other pertinent information within 3 calendar days of their appointment.
- (4) Ensure that before accepting an investigation report, the draft has been reviewed by a QRP and that their comments have been resolved.
- (5) Verify acceptance of an accident investigation report by signing and dating a statement to be incorporated into the report.
- (6) Publish and distribute the accident investigation report within 14 calendar days of accepting the report, in accordance with the distribution indicated in paragraph 4e.
- (7) Determine and document any lessons learned resulting from the accident and the accident investigation, and provide the lessons learned document

to the Deputy Assistant Secretary for Performance Assessment and Analysis for dissemination throughout the Department.

- (8) Determine whether applicable memoranda of understanding have been executed through Headquarters or field organizations for allowing employees from other Agencies to serve on investigation boards.
- (9) Notify Agencies with which the Department has memoranda of understanding or which have responsibilities or interests related to the accident under investigation.
- (10) Notify the Deputy Assistant Secretary for Facility Safety when other Agencies are informed of accidents under investigation.

i. Accident Investigation Program Points of Contact.

- (1) Ensure that all of the requirements of this Order are understood by the field organization or other organizations for which they work and that the Order's requirements can be carried out by Federal and contractor staff.
- (2) Serve as liaison to the Accident Investigation Program manager on matters pertaining to the Accident Investigation Program.
- (3) Review additional responsibilities delineated in Chapter III, paragraph 11.0, and Chapter IV, paragraphs 1.1-1.6 of DOE G 225.1A-1, *Implementation Guide for Use with DOE Order 225.1, Accident Investigations*, dated 11-26-97.

j. Accident Investigation Board Chairpersons.

- (1) Manage the investigation process, direct board members in their activities, and represent the Department in all matters regarding an accident investigation.
- (2) Ensure that a thorough and credible investigation is completed.
- (3) Notify the Director, Office of Enforcement and Investigation, of any potential Price-Anderson Amendments Act enforcement concerns identified during an investigation.
- (4) Notify DOE, Federal, State, or local investigative or law enforcement agencies of suspected unlawful activity identified during an accident investigation.
- (5) Coordinate board activities with all organizations having an interest in the accident.

- (6) Ensure that the board is supported by appropriate advisors and consultants with specialized expertise as deemed necessary.
- (7) Resolve board members', advisors', or consultants' potential conflicts of interest.
- (8) Resolve any QRP comments on an accident investigation report before submitting the report to the appointing official for acceptance.

k. Accident Investigation Boards.

- (1) Conduct thorough investigations of individuals, organizations, management systems, and facilities as follows.
 - (a) Examine an accident scene and DOE or NNSA and contractor documentation.
 - (b) Interview witnesses and other personnel directly associated with an accident.
 - (c) Perform engineering tests and analyses.
 - (d) Examine compliance with applicable policies, standards, and requirements.
 - (e) Examine Headquarters and field management safety systems that could have contributed to or prevented an accident.
- (2) Following analysis of the facts, identify causal factors and judgments of need [paragraph 4e(3)].
- (3) Evaluate accident-related matters including—
 - (a) effectiveness of safety management systems as defined in DOE P 450.4, *Safety Management System Policy*,
 - (b) adequacy of policy and policy implementation, and
 - (c) effectiveness of line management oversight.
- (4) Conduct an internal review of the investigation process [paragraph 4f(4)].
- (5) Report investigation results.
- (6) Review the report to ensure technical accuracy, completeness, and internal consistency.

- (7) Ensure that a report includes findings from analysis of management control and safety systems that may have contributed to the accident;
 - (8) Ensure that qualified, authorized reviewers have determined that the report contains no classified or unclassified controlled nuclear information or information protected by the Privacy Act.
- 1. Contracting Officers. Once notified, incorporate the CRD of this Order into the laws, regulations, and DOE directives clause of affected site/facility management contracts.
- 7. CONTACT. Questions concerning this Order can be directed to the Office of Facility Safety at 202-586-4693.

BY ORDER OF THE SECRETARY OF ENERGY:

KYLE E. McSLARROW
Deputy Secretary

**PRIMARY DEPARTMENT OF ENERGY ORGANIZATIONS
TO WHICH O 225.1X, *Accident Investigations*, IS APPLICABLE**

Office of the Secretary
Chief Information Officer
Departmental Representative to the Defense Nuclear Facilities Safety Board
Energy Information Administration
National Nuclear Security Administration*
Office of Civilian Radioactive Waste Management
Office of Congressional and Intergovernmental Affairs
Office of Counterintelligence
Office of Economic Impact and Diversity
Office of Electric Transmission and Distribution
Office of Energy Assurance
Office of Energy Efficiency and Renewable Energy
Office of Environment, Safety and Health
Office of Environmental Management
Office of Fossil Energy
Office of General Counsel
Office of Hearings and Appeals
Office of Independent Oversight and Performance Assurance
Office of the Inspector General
Office of Intelligence
Office of Legacy Management
Office of Management, Budget and Evaluation and Chief Financial Officer
Office of Nuclear Energy, Science and Technology
Office of Policy and International Affairs
Office of Public Affairs
Office of Science
Office of Security
Office of Security and Safety Performance Assurance
Secretary of Energy Advisory Board
Southeastern Power Administration
Southwestern Power Administration
Western Area Power Administration

CONTRACTOR REQUIREMENTS DOCUMENT

DOE O 225.1X, *Accident Investigations*

Regardless of the performer of the work, the contractor is responsible for complying with the requirements of this Contractor Requirements Document (CRD). The contractor is responsible for flowing down the requirements of this CRD to subcontractors at any tier to the extent necessary to ensure the contractor's compliance with the requirements. In doing so, the contractor must not flow down requirements to subcontractors unnecessarily or imprudently. That is, the contractor will ensure that it and its subcontractors comply with the requirements of this CRD and incur only those costs that would be incurred by a prudent person in the conduct of competitive business.

1. GENERAL REQUIREMENTS.

- a. Contractors will support Type A and Type B investigations of accidents at sites under their cognizance.
- b. Contractors will establish training for and maintain readiness to—
 - (1) respond to accidents,
 - (2) mitigate accidents consequences,
 - (3) assist in collecting and preserving evidence,
 - (4) assist in conducting investigations,
 - (5) preserve an accident scene to the extent that it is under contractor control,
 - (6) photograph and otherwise document an accident scene,
 - (7) provide office space and equipment for accident investigation board members,
 - (8) meet regularly with board members to discuss issues surrounding the accident, and
 - (9) provide general administrative assistance.

2. CORRECTIVE ACTION PLANS. Contractors will also prepare, implement, and track to completion, approved corrective action plans that satisfy judgments of need documented in the approved Accident Investigation Report.

ACCIDENT INVESTIGATION CATEGORIZATION ALGORITHM

1. INTRODUCTION.

- a. Accidents will be characterized expeditiously, to determine if either a Type A or Type B investigations will be conducted based on the criteria indicated below (and in paragraph 4a of the Order).
- b. While in most cases the categorization of an accident will be clear, the DOE Deputy Assistant Secretary for Facility Safety or NNSA Deputy Administrator for Defense Programs coordinates with heads of DOE or NNSA field organizations to resolve uncertainty in categorization.
- c. Accidents not meeting criteria for Type A or Type B investigations will be categorized, investigated, and reported in accordance with the requirements of DOE O 231.1A, *Environment, Safety and Health Reporting*, dated 8-19-03; DOE M 231.1-1, *Environment, Safety and Health Reporting Manual*, dated 3 19-04; and DOE M 231.1-2, *Occurrence Reporting and Processing of Operations Information*, dated 8-19-03. Conducting investigations as required by these Orders may provide indicators of future, more severe accidents and with early detection and corrective actions may prevent more serious accidents.
- d. The following requirements apply to vehicle accidents that meet criteria for Type A or Type B investigations and involve Federal or contractor employees driving Government, rented, or personal vehicles while on official government business.
 - (1) Onsite accidents will be investigated unless the head of the responsible field organization requests and receives a waiver in accordance with the requirements of paragraph 5 of this Order.
 - (2) Offsite accidents will not be investigated unless the head of the field organization determines that an investigation is appropriate based on circumstances surrounding the accident or the potential for significant lessons learned.
- e. The following categorization criteria apply to accidents resulting from DOE, its contractor, or subcontractor operations.

2. HUMAN EFFECTS.

- a. Accidents Requiring Type A Investigations.
 - (1) An injury or chemical or biological exposure that results in or is likely to result in a fatality to a DOE, NNSA, contractor, or subcontractor employee or a member of the public.

NOTE: A fatal injury as defined in Title 49 Code of Federal Regulations (CFR) 830.2 is any injury that results in death within 30 days of the incident.

- (2) An accident in which three or more DOE, NNSA, contractor, or subcontractor employees or members of the public incur an illness or injury that—
 - (a) requires hospitalization for more than 48 hours within 7 calendar days from the date the injury occurred;
 - (b) results in severe hemorrhage;
 - (c) results in severe damage to nerves, muscles, tendons, or internal organs;
 - (d) results in second or third degree burns affecting more than 9 percent of the body surface; or
 - (e) has a high probability of resulting in a permanent, total disability from injuries or chemical biological exposures received.
- (3) A single individual receiving radiation exposure (see 10 CFR 835.202, Occupational Exposure Limits for General Employees) resulting in—
 - (a) a total effective dose equivalent of 25 rem or more;
 - (b) a dose equivalent of 75 rem or more to the lens of the eye;
 - (c) a willow dose equivalent of 250 rem or more to an extremity or skin;
 - (d) a deep dose equivalent sum of 250 rem or more for external exposure plus the committed dose equivalent to any organ or tissue other than the lens of the eye;
 - (e) a dose equivalent of 2.5 rem or more to the embryo or fetus of a declared pregnant worker; or
 - (f) an initial dose estimate that indicates any of these values may be exceeded.

b. Accidents Requiring Type B Investigations.

- (1) An accident that results in the hospitalization of one or more DOE, NNSA, contractor, or subcontractor employees or members of the public, for

5 continuous calendar days or longer as a result of an injury, illness, or chemical or biological exposure.

For the purposes of this paragraph, day counts do not include the day of admission, but do include the day of discharge.

- (2) An accident that results in 5 or more lost-workday cases.
- (3) A series of accidents within a 1-year period resulting in 5 or more lost-workday cases involving identical or similar facilities, systems, equipment, materials, or procedures, indicating a pattern that is cause for concern.
- (4) Radiation exposure to an individual (see 10 CFR 835.202, Occupational Exposure Limits for General Employees) resulting in—
 - (a) a total effective dose equivalent of at least 10 rem but less than 25 rem;
 - (b) a dose equivalent of at least 30 rem but less than 75 rem to the lens of the eye;
 - (c) a willow dose equivalent of at least 100 rem but less than 250 rem to an extremity or skin;
 - (d) a deep dose equivalent sum of at least 100 rem but less than 250 rem for external exposure and the committed dose equivalent to any organ or tissue other than the lens of the eye;
 - (e) a dose equivalent of at least 1 rem but less than 2.5 rem to the embryo or fetus of a declared pregnant worker; or
 - (f) an initial dose estimate that indicates any of these values may be exceeded.

3. ENVIRONMENTAL EFFECTS.

- a. Accidents Requiring Type A Investigations. Release of a hazardous or extremely hazardous substance, material, waste, or radionuclide that results in serious environmental damage, either onsite or offsite, in an amount greater than 5 times the reportable quantities specified in 40 CFR Parts 302 or 355.
- b. Accidents Requiring Type B Investigations. Release of a hazardous or extremely hazardous substance, material, waste, or radionuclide that results in serious environmental damage either on-site or off-site in an amount equal to or greater than 2 times but less than 5 times the reportable quantities specified in 40 CFR Parts 302 or 355.

4. PROPERTY EFFECTS.

a. Accidents Requiring Type A Investigations.

- (1) Estimated loss of or damage to DOE, NNSA, or other property, including aircraft damage, equal to or greater than \$2.5 million or requiring estimated costs equal to or greater than \$2.5 million for cleaning, decontaminating, renovating, replacing, or rehabilitating structures, equipment, or property.
- (2) Any apparent loss, explosion, fire, or theft involving radioactive or hazardous material under the control of DOE, NNSA, contractors, or subcontractors in quantities and under circumstances that constitute a hazard to human health and safety or private property.
- (3) An unplanned nuclear criticality.

b. Accidents Requiring Type B Investigation.

- (1) Estimated loss of, or damage to, DOE, NNSA or other property, including aircraft damage, of more than \$1 million but less than \$2.5 million, or requiring estimated costs of more than \$1 million but less than \$ 2.5 million for cleaning, decontaminating, renovating, replacing, or rehabilitating structures, equipment, or property.
- (2) The operation of a nuclear facility beyond its authorized limits, which results in the consequences identified in paragraphs 2, 3, and 4 of this Attachment.

c. Cost Estimates of Accidents Requiring Type A or Type B Investigations. When estimating the cost of an accident, follow guidance in DOE G 430.1-1, *Cost Estimating Guide*, dated 3-28-97.

5. OTHER EFFECTS.

a. Accidents Requiring Type A Investigations. Any accident or series of accidents for which the Secretary of Energy, the Assistant Secretary for Environment, Safety and Health (for DOE sites), or the NNSA Deputy Administrator for Defense Programs (for NNSA sites) determines that a Type A investigation is appropriate.

b. Accidents Requiring Type B Investigations.

- (1) An accident or series of accidents for which the Secretary, Assistant Secretary for Environment, Safety and Health (for DOE sites), NNSA Deputy Administrator for Defense Programs (for NNSA sites), Secretarial Officer, or the head of a field organization determines that a

- (2) Type B investigation is appropriate. Examples include Departmental crosscutting issues or issues warranting the attention of local news or interest groups.
- (3) Any near miss or series of near miss occurrences for which a Type B investigation is deemed appropriate by a DOE or NNSA line Secretarial Officer or the head of a field organization.

DEFINITIONS

- a. accident investigator—an individual qualified to serve on accident investigation boards in accordance with the requirements of the Accident Investigator Qualification Standard (see DOE G 225.1A-1, *Implementation Guide for use with DOE O 225.1 Accident Investigations*, dated 11-26-97).
- b. appointing official—a designated authority responsible for assigning personnel to serve on accident investigation boards for Type A and Type B investigations, with responsibilities as prescribed in paragraph 5h of DOE O 225.1X, *Accident Investigations*, dated XX-XX-04.
- c. causal factor—a condition in an accident sequence that produced or contributed to the accident. Causal factors fall into three categories as follows.
 - (1) direct cause—the immediate event or condition that caused the accident.
 - (2) root cause—factors that require corrective actions to prevent recurrence of the same or a similar accident.
 - (3) contributing cause—an event or condition that, when viewed collectively with other causes, increased the likelihood of but viewed alone, did not cause an accident.
- d. heads of field organization—managers of operations offices, service centers, site offices, area offices, and regional offices of federally staffed laboratories and Power Marketing Administrations (excluding individual duty stations) located outside the Washington, D.C., metropolitan area.
- e. injury or illness
 - (1) injury—an abnormal condition or disorder, e.g., a cut, fracture, sprain, or amputation.
 - (2) illness—an acute or chronic condition, e.g., a skin disease, respiratory disorder, or poisoning. (From 29 CFR 1904.26)
- f. judgments of need—managerial controls and safety measures necessary to prevent or minimize the probability or severity of an accident recurring.
- g. lesson learned—a good work practice or innovative approach captured and shared to promote its repeated application. A lesson learned also may be an adverse work practice or experience that is captured and shared to avoid recurrence.

- h. limited scope investigation—an accident investigation that the NNSA Deputy Administrator for Defense Programs or the Assistant Secretary for Environment, Safety and Health chartered and that falls outside the traditional scope, duration, or resources associated with a Type A or Type B investigation.
- i. near miss—an occurrence where no barrier to the initiation of an accident was present or only one barrier existed that prevented personnel injury, equipment damage, or environmental concerns.
- j. quality review panel—DOE or NNSA personnel who are familiar with the accident investigation process and act independent of an accident investigation; panels who are appointed to review draft investigation reports to ensure the reports clearly and concisely convey the results of investigations.
- k. readiness team—trained personnel who are available for initial investigative response immediately following an accident.